

The University of Chicago

THE RELATIVE ABILITY OF THE
STATES TO FINANCE PUBLIC
EDUCATION

A PART OF A DISSERTATION SUBMITTED TO
THE FACULTY OF THE DIVISION OF THE
SOCIAL SCIENCES IN CANDIDACY FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF EDUCATION

1940

By

WILLIS LIONEL MILLER

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Education in the National Life

The development of a system of public elementary and secondary schools has been one of the outstanding achievements of the American people. Over twenty-six million pupils were enrolled in these schools during the years 1935-1936. The enrolment in these years constituted almost twenty-one per cent of the total population and a little over eighty-three per cent of the children of school age. Current expenditures were more than one and one-half billion dollars during this period, and school property was valued at almost seven billion dollars. From these figures it is evident that public education has reached such proportions that it is one of the major interests in our national life.

Although great sums of money have been spent for education and the enrolment in our schools is increasing annually, the achievements thus far are short of the desired goal and there are disturbing weaknesses in our educational systems. Sixty-five million of the seventy-five million adults in this country have not completed high school and almost four million are illiterate. It is probable that many failed to receive an education because of inadequate educational opportunities. This inadequacy is illustrated by the fact that in 1935-1936 there were in the United States more than one hundred and thirty thousand one-room schools, and in addition there were countless other schools deficient in facilities for services other than regular classroom instruction. Such services as guidance, placement, health clinics and health education, physical education, recreation and extra-curricular activities are unknown in a majority of our schools. The weaknesses in our educational systems probably can be best illustrated by an examination of the current expenditures per child of school age, for, in general, there is a high relationship between the amount of expenditure and the quality of service provided. The twelve states with the greatest expenditures per child 5-17 years

of age spend annually more than three times as much as the twelve states which spend the least, and the expenditures per child range from \$109.87 per year in Nevada to \$15.81 in Arkansas. Such variation in expenditures obviously would result in educational inequalities. It is difficult to deny that weaknesses are present in our educational systems when some states are able to spend three or four times as much per pupil, provide buildings worth four or five times as much, pay higher salaries to their teachers, hold school open a month or two longer each year, and provide education for a much larger percentage of their children than other states.

State constitutions, state laws and regulations, court decisions, and widespread references in educational writings have so thoroughly indoctrinated the public to the principle of state responsibility for education, that many believe that the federal government should take no active interest in the promotion of educational affairs. Changing social conditions and the increasing interdependence of states have resulted in a large number of people now believing that public education is not exclusively a state responsibility but that it is also a responsibility of the federal government. Although no specific provisions for education were made in the Constitution, substantial evidence is available that the framers had a very definite interest in education and a belief that it should be a vital part of the national life and as such should be an interest of the federal government. Recent interest of leaders and educators, however, dates from the World War of 1914-1918 when attention was drawn to the inadequacy of the American system of education by the poor training and illiteracy of the soldier recruits. This increased national interest in education is further evident in the amount of space devoted to the subject in current literature, by the attention given the subject at national educational conventions, by the findings of research carried out by private and governmental agencies, by the many bills on education which come before Congress, and by the numerous resolutions of industrial, labor, and lay organizations which appear each year.

Since the preservation of a democracy depends upon an educated citizenry and since opportunities for education are unequally available in the various states, many leaders and educators have set about the task of equalizing educational opportunities. A solution of this problem seems to lie in some financial assist-

ance from the federal government. Federal assistance is necessary because many of the factors which cause educational inequalities are beyond the control of the states.

Inequality of Educational Opportunity

A major reason for educational inequalities is the manner in which financial support is provided. The property tax has always been the principal source of support for the schools; but the disintegration of this tax, brought about by the rise of an industrial society with new forms of wealth not reached by the property tax, and the fact that the schools are organized in so many small independent jurisdictions (about 127,000 in 1935), each a separate taxing unit, have resulted in a disproportionate distribution of financial resources and inadequate tax revenue for many states.

The disproportionate distribution of financial resources would not result in educational inequalities if the educational burdens were similarly distributed. The states with the greatest educational burdens, however, are not generally the states with the greatest financial resources. Extremely diverse differentials in the fertility of women in the various states have resulted in unequal burdens of child care and education. The number of children aged 5-17 per 1,000 adults 20 to 64 years of age varies from 319 in California to 739 in South Carolina. Many states fail to replace their population by as much as 20 per cent while others have a reproduction index of 130 or more.

Another factor which contributes to unequal educational burdens is the extent of internal migration in this country. Each census since 1850 has shown that more than one-fifth of the total of those born in the United States resided at the time of the census in states other than the ones in which they were born. At first, migration was westward to the undeveloped areas, but with the closing of the frontier, the migration has tended to be a movement from rural areas to urban centers, a movement of young adults from farm to city, a movement resulting in heavy burdens of education upon the farmers, who, with a minor portion of the country's economic resources, educate a major portion of the children, only to have them migrate to the cities just as they are becoming able to repay the expense necessary to rear them. It has been estimated that people in the cities, as a whole, have borne and reared less

than fifty per cent of their present urban population.

The great disparity between the distribution of economic resources and educational burdens has stimulated research to develop plans for equalizing educational opportunities. In order to obtain equalization in its fullest sense, "equalization of educational opportunity" and "equalization of school support," it is necessary to provide all the children in the States with equal educational opportunities up to a prescribed minimum and to finance this program according to the financial ability of the States. This means that an equalization formula must contain a measure of the financial ability of the States and also a measure of their educational need.

Relative Financial Ability of the States

In obtaining a formula for determining the relative ability of the States to finance public education, the two component measures, financial resources and educational need, are determined separately and then combined to form the final index.

The taxpaying ability of the States may be determined by estimating the amount of funds which each state could raise by the application of a uniform tax plan, or it may be determined indirectly by means of an economic index which estimates the relative economic resources upon which a tax system must bear.

Newcomer¹ used as an index of taxpaying ability a tax plan composed of taxes on personal income, real estate, business income, stock transfer, corporation organization, and severance. Chism² used a tax plan based upon recommendations of the National Tax Association. Chism's plan, however, included certain taxes of a benefit nature which should not be included in an index of ability. The need for determining what constitutes a model tax plan and for improving the necessary techniques for estimating tax yields has deterred the development of this type of financial ability index.

The older and more common method of determining financial

¹Mabel Newcomer, An Index of the Taxpaying Ability of State and Local Governments. New York: Bureau of Publications, Teachers College, Columbia University, 1935.

²Leslie L. Chism, The Economic Ability of the States to Finance Public Schools. New York: Bureau of Publications, Teachers College, Columbia University, 1936.

ability is by means of economic indexes. The first indexes of economic resources were based on a single measure, assessable wealth. Wealth alone, however, did not adequately measure financial ability; so a combination of wealth and income was tried. As the structure of society became more complex and wealth became more diversified, the number of economic items was increased in an effort to measure every phase of economic life. The problems of what items to include in the index and how to combine the items increased in importance as the complexity of wealth increased. Usually these problems have been ignored or dealt with in an arbitrary manner. Norton and Norton³ devised an economic index based on ten items, but they gave no reason for the selection of these particular items rather than any other ten items and they combined them quite arbitrarily. Mort⁴ undertook to rate subjectively quite a few items and then selected what he thought were the better measures and weighted them in terms of the net effects which each measure had upon the criterion, independently of the effects of the other measures. The criterion of taxpaying ability was the yield of the six taxes selected by Newcomer (vide supra). This method of weighting the measures in an index represents a distinct improvement over previous attempts.

Use of Factor Analysis in Developing an Index of Financial Ability

A mathematical technique recently made available permits still further improvement in devising an index of financial ability. This technique, known as factor analysis, provides an objective basis for the selection and weighting of items in the index.

Factor analysis may be regarded as a mathematical method for classifying a great variety of attributes of a population into a relatively small number of distinct categories. In addition to providing a parsimonious description of a variety of measures, the factor analysis also shows the extent to which each measure is associated with the other measures. In this study the population

³John K. Norton and Margaret Alltucker Norton, Wealth, Children and Education. 2d ed. New York: Bureau of Publications, Teachers College, Columbia University, 1938.

⁴Paul R. Mort, Federal Support for Public Education. New York: Bureau of Publications, Teachers College, Columbia University, 1936.

was the forty-eight States and the attributes analyzed were twenty-nine measures of the economic resources of the respective states.⁵ All the intercorrelations of these twenty-nine economic measures constituted the basic data for the factor analysis.⁶

In a factor analysis the intercorrelations between the variables are assumed to be due to the presence of a number of common, statistically independent factors, and the lack of perfect correlation between the variables is accounted for by a unique factor present in each variable. A common factor, then, can be defined as a factor which is involved in more than one variable of a set, whereas a factor which appears exclusively in a particular variable is said to be unique.

If it is further assumed that every variable can be represented by a linear function of such factors, a set of equations, one equation for each variable is obtained. Each equation contains a unique factor and several common factors with their appropriate weights and coefficients. A set of equations in this form may be defined as a factor pattern.

Because all variables (including the factors) are in standard form (this means that the standard deviation has been used as the unit of measurement), and since the variance of a variable in standard form is equal to unity, the total variance of any measure is equal to one and the relative contribution of a factor is determined by obtaining the square of the coefficient of the factor. In order to determine the portion of the total unit variance of a measure due to the common factors, it is only necessary to obtain the sum of the squares of the common factor coefficients. The resulting sum is known as the communality of the variable.

If the communality of a variable is low, it is an indication that a large portion of the variable is unique; that is, the variable is not closely associated with the other variables and thus it is not a very good measure of the same thing that the other variables measure. If the original variables included in the study

⁵A list of these twenty-nine measures and their sources is given in the appendix.

⁶The averoid method of factor solution was used in this study and follows the procedures described by Holzinger and Harman, Factor Analysis: A Synthesis of Factorial Methods. Chicago: The University of Chicago Press, 1941.

measure economic resources, then it is apparent that the variables which have little in common with the other variables (low communality) either do not measure economic resources or they may be considered as poor measures. The communalities of the variables, in addition to showing which measures are not closely associated with the group of variables, also show relatively how good each measure is in estimating the criterion. It becomes evident, then, that once the communalities are known, the measures which contribute the most in predicting the criterion can be selected and weighted in an index according to their contribution. The method of weighting the measures in this study was to multiply each economic measure by its communality. Table 1 shows the communalities of the twenty-nine measures.

Table 1 is interpreted as follows. Variable 1, which is net income from individual tax returns, has a communality of .992. This means that almost all of the possible variance (1.000) is accounted for by factors common to some or all of the variables in the set. The fact that all the unit variance was not accounted for is likely due to errors of estimate. (In any branch of science observed measurements are somewhat different from computed measurements because of measurement errors.) Since practically all the variance is described by the common factors, this variable may be considered as a good measure of financial ability. Each of the variables can be interpreted in the same manner.

The higher the communality of a variable, the better the variable is as a measure of financial ability; similarly, a variable with low communality would be a poor measure. There is no definite point, however, at which the communality of a variable can be said to be either high or low. It was assumed in this study that if more than half of the total unit variance was accounted for by common factors, the variable would be retained in the final index. Although actually all variables retained had communalities greater than .720.

Attention is called to variables 6, 9, 18, and 23. It is noted that their communalities are very low, ranging from .418 down to .101. These low communalities indicate that by far the greater portions of these variables are not associated with the other variables in the set, and thus may be assumed not to be measures or to be very poor measures of financial ability. Since these variables contribute very little to the prediction of finan-

TABLE 1

COMMUNALITIES OF THE TWENTY-NINE ECONOMIC MEASURES

Variable J	Communality h ²	Variable J	Communality h ²	Variable J	Communality h ²
1*	.992	11	.912	21	.988
2	.995	12	.987	22	.723
3	.957	13	.956	23	.264
4	.826	14	.991	24	.997
5	.889	15	.978	25	.991
6	.259	16	.793	26	.929
7	.957	17	.772	27	.929
8	.965	18	.101	28	.898
9	.418	19	.949	29	.960
10	.990	20	.780		

*1-Net Income from Individual Income Tax Returns, 2-Number of Individual Income Tax Returns Filed, 3-Motor Vehicle Registrations, 4-Number of Wage Earners, 5-Value Added by Manufacture, 6-Value of Mineral Products, 7-Number of Gallons of Gasoline, 8-Net Paid Circulation of Newspapers, 9-Building and Loan Assets, 10-Number of Telephones, 11-Bank Resources, 12-Number of Radio Families, 13-Postal Receipts, 14-Retail Sales, 15-Total Wealth, 16-Postal Savings Deposits, 17-Value of Farms, 18-Average Value per Farm, 19-State Tax Collections, 20-Number of Postal Savings Depositors, 21-Life Insurance, 22-Gross Farm Income, 23-Per Cent of Population Filing Income Tax Returns, 24-Realized National Income, 25-Spendable Money Income, 26-Savings and Other Time Deposits, 27-Production of Electric Power, 28-Wholesale Net Sales, 29-Amusement Receipts.

cial ability, they were dropped from the final index.

It has not been the burden of this research to show that even though certain items may be very good measures of economic resources, they may not be good measures to include in an index of financial ability. The only rationale for the inclusion or exclusion of items in the final index was their statistical performance in the factor analysis. If, as determined by its communality, a measure seemed to belong to the set, it was retained in the final index, and if it did not seem to belong, it was not retained. The final index was based upon twenty-four measures.

Before a variety of items measured in different units can be combined into an index, they must first be reduced to comparable units. Although the weight given each measure was determined by the factor analysis, the method of combining the measures into an index can be either dependent on or entirely independent of the factor analysis. The simplest and probably the best known method

of combining measures into an index is known as the percentage method. In this method the various units of measurement are made comparable by obtaining all figures as percentages. This is done by dividing the figure representing the value of an economic item for a given State by the total of the figures on that item for all the States. The quotient is the percentage of the economic item in the selected state. The sum of the percentage figures for each economic item for all the States will thus be one hundred per cent. With all the economic measures in percentage form they may be combined by simple addition or they may be weighted in appropriate manner and then added. It has already been shown that the various measures are not equally good as indicators of economic resources; therefore, any index of economic resources which gives equal weight to its components will contain an indeterminant error and will favor some states to the disadvantage of others. For this reason each item was weighted according to its contribution to the index as determined from Table 1.

The entire procedure is illustrated by the following example. The average number of registered motor vehicles in Texas in 1935 and 1936 was 1,430,114 and the average for the United States for these years was 27,021,800. If the former figure is divided by the latter, the percentage of registered motor vehicles in Texas of all the registered vehicles in the United States is obtained. This percentage, 5.292, is then multiplied by .957 and the result, 5.064, is the weighted figure used in the final index. The same procedure was followed in obtaining and weighting all items. These weighted figures for the twenty-four items were then added by states and the state totals were divided by 24. The resulting quotients when transmuted to a percentage basis constituted the indexes for the States. These indexes are shown graphically in Figure 1.

From Figure 1 it can be seen that New York has the greatest economic resources. It is found to have 16.06 per cent of the Nation's resources. Pennsylvania, the second ranking state, has 7.81 per cent of the Nation's resources, while Nevada, the state with the least resources, is shown to have only .11 per cent of the Nation's resources.

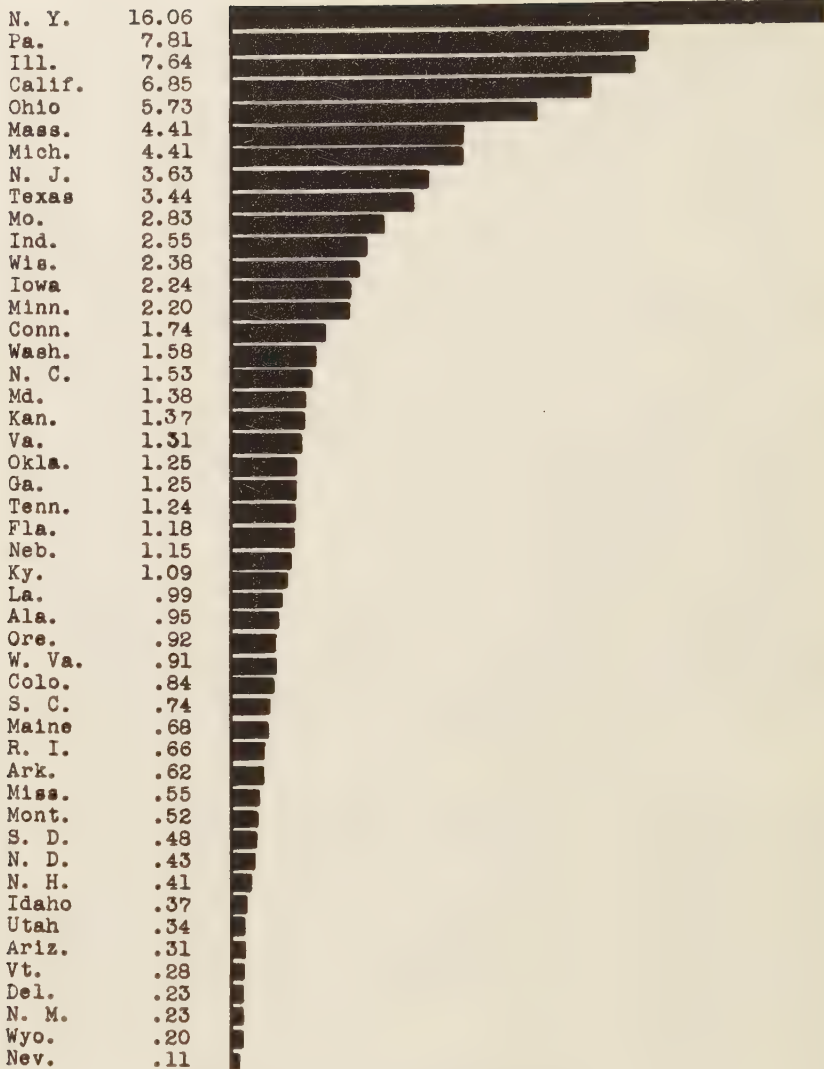


Figure 1.--Indexes of Economic Resources of the States
(Average for 1935 and 1936)

Relative Educational Needs of the States

Educational need may be defined as the cost of a given educational program, and a measure of this need can be obtained independently of the level of the program. When this is done, the result is a measure of "relative need" only. To get the "absolute need" one simply multiplies the index of "relative need" by an amount deemed sufficient to finance an acceptable educational program. The concern here is only with "relative need"; the task of determining the cost of an acceptable program is outside the scope of this volume.⁷

A variety of measures of educational need have been tried but the consensus of recent studies is that either the number of children of school age or the number of pupils in average daily attendance should be used as the basic measure of educational need; and, if possible, some correction should be made for certain variations which affect the cost of comparable educational programs.

The educational need of the States is measured in this study by the number of children aged 5-17. Census data were used in preference to attendance data because they better satisfy the ideals of democracy. While attendance data only account for the number of children for which the state has already provided, census data take into account the number of children for which a state should provide. Census data insure each child of equal treatment as regards financial aid; attendance data favor the more able states. Census data have the further advantage of being more objective, and since the figures are collected by the federal government, the data are free from local manipulation.

Factors which may affect the educational need of the States include variation in cost due to sparsity of population, variation in living costs, need for transportation, capital outlay, and variation in the cost of educating elementary and high school pupils. If the basic measure of need is census data, the factor of variation in elementary and high school costs does not affect the need, for the proportion of children of high school age of the total number of children of school age is about the same in all states. Studies of the proportion of school revenue de-

⁷Unless otherwise specified, "educational need" or "education load" as used in this study refers to "relative" educational need.

voted to new buildings and improvements on existing buildings show that the ratio of capital outlay to current expenses is constant. There is therefore no reason for making special provisions for capital outlay in a measure of educational need. The need for transportation is a factor that affects the need (cost) for education, but the transportation need of the various states can not be predicted by a single general formula. Several attempts have been made to predict the transportation need of the States by a formula involving the ratio, density of school population. All such methods have been unsuccessful. Proposals that allowance for transportation costs be made upon the basis of actual expenditures for transportation are in direct contradiction to the principle of equalization. Provisions for transportation facilities should be made by the States individually, and a general prediction of the transportation need for all States should not be attempted.

The factors, sparsity of population and variation in living costs, are very important in their effect upon educational need and should properly be accounted for in any method for determining the educational need of the States. Unfortunately, data are not available for correcting a measure of educational need for these factors. Attempts to correct for population sparsity by means of formulae utilizing some measure of "population density" have been futile. There have been no studies of the living costs of teachers in all the States and the assumption that cost-of-living indexes based on data from a few states would be equally applicable to all the States is erroneous. An index similar to the one developed by Harry⁸ for the State of New York might be developed on a national basis, but at present, insufficient information on living costs of teachers precludes an adjustment of the educational need measure for this factor. The failure to correct the need index for variation in living costs and variation in cost due to population sparsity may not be so serious, for to some extent these factors offset each other. The correction for living costs favors urban areas while the correction for sparsity of population favors rural areas. To what extent these corrections are compensating, however, is not known, nor is it possible to ascertain the error which exists if no correction is made for either factor.

⁸David P. Harry, Jr., Cost of Living of Teachers in the State of New York. New York: Teachers College, Columbia University, 1928.

Much less progress has been made in devising an acceptable formula for the measurement of educational need than for the measurement of financial ability. This lack of progress is largely due to the fact that relevant data are not available. For this reason, the simple measure, number of children aged 5-17, is preferable to a complex index which has been arbitrarily weighted on the basis of inadequate data.

Since the indexes of educational need are to be combined in a later section with the indexes of economic resources, it is necessary to convert the raw values (number of children aged 5-17) into percentages as was done with the economic resources. Converting the raw values into percentage figures is accomplished in the same manner as was the conversion of the economic items (vide supra). The percentage of children aged 5-17 in the United States who live in each state is shown graphically in Figure 2.

An examination of Figure 2 shows New York to have the greatest educational need, with 8.72 per cent of the Nation's children. Pennsylvania, the state with the second greatest need, has 7.93 per cent of all the children, while Nevada, the state with the least educational need, has only .06 per cent of the Nation's children.

The Relative Ability of the States to Finance Public Education

The relative ability of the States to finance education depends upon the relationship between economic resources and educational need rather than upon either factor individually. While the variation in the relative ability to finance education is not as great as the variation which has been shown for either resources or need, it does result in great inequalities of educational opportunities between the States.

Measures of the relative educational need and the relative resources of the States were developed separately in preceding chapters, but if the concern is equalization of educational programs among the States, then these measures considered independently of each other have little meaning. For instance, three states may have equal resources, but one state might have more than average educational need, one state have average need, and one state have less than average need; the relative ability to support a comparable educational program would be different in each case. Similar-

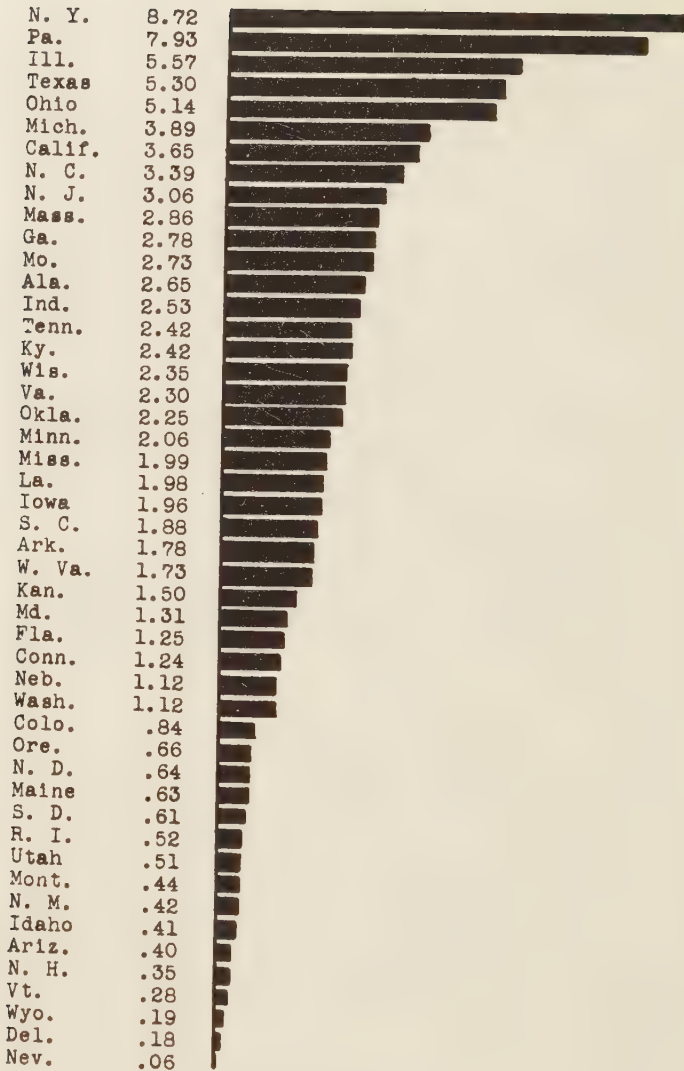


Figure 2.--Indexes of Educational Need of the States
(Average for 1935-1936)

ly, three states may have equal educational need but one state may have more than average resources, one state have average resources, and one state have less than average resources; again, the relative ability to finance education would be different in each case.

Many people falsely assume that because a state has great wealth it has great ability to support public education, or that because a state has many children it has little ability. The fact is that several states have large percentages of the nation's resources, yet rank low in ability to provide education; while others which have more than the average number of children rank above average in ability. Pennsylvania, for instance, ranks second in the nation in financial resources, yet because it has a large number of children it is slightly below average in ability to finance education (see Table 2). Texas also ranks high in resources but ranks relatively low in ability. That some states may have a large number of children and at the same time have more than average ability is illustrated by California and Massachusetts. An interesting comparison from Table 2 is afforded by New York and Nevada. New York ranks first in number of children and in resources while Nevada ranks last in number of children and resources; yet both rank among the first in ability to finance education. Numerous other examples could be noted, but it seems unnecessary to go further in establishing the fact that the ability of a state to support public education depends upon the relationship between economic resources and educational need rather than upon either factor individually.

The relationship between educational need and economic resources can be expressed in several ways. Vastly different results will be obtained, depending upon the way in which these factors are combined. The most common and in many ways the best method of combining the factors may be described by an equation of the form:

$$\frac{\text{Relative Ability to Finance Education}}{\text{Relative Economic Resources}} = \frac{\text{Relative Educational Need}}{\text{Relative Educational Need}}$$

Relative ability was determined in this study by use of such an equation. Measures of educational need and economic resources of the States were obtained as percentages of the United

TABLE 2

RELATIVE ABILITY OF THE STATES TO FINANCE EDUCATION, 1935-1936
Based on Weighted Economic Resources and Number of
Children Aged 5-17

State	Per Cent of Total		Relative Ability ^c
	Economic Resources ^a	Number of Children Aged 5-17 ^b	
Alabama	.946	2.65	.36
Arizona	.305	.40	.76
Arkansas	.616	1.78	.35
California	6.852	3.65	1.88
Colorado	.835	.84	.99
Connecticut	1.744	1.24	1.41
Delaware	.230	.18	1.28
Florida	1.177	1.25	.94
Georgia	1.250	2.78	.45
Idaho	.370	.41	.90
Illinois	7.639	5.57	1.37
Indiana	2.548	2.53	1.01
Iowa	2.237	1.96	1.14
Kansas	1.371	1.50	.91
Kentucky	1.089	2.42	.45
Louisiana	.991	1.98	.50
Maine	.681	.63	1.08
Maryland	1.381	1.31	1.05
Massachusetts	4.413	2.86	1.54
Michigan	4.410	3.89	1.13
Minnesota	2.197	2.06	1.07
Mississippi	.548	1.99	.28
Missouri	2.830	2.73	1.04
Montana	.524	.44	1.19
Nebraska	1.148	1.12	1.03
Nevada	.114	.06	1.90
New Hampshire	.411	.35	1.17
New Jersey	3.634	3.06	1.19
New Mexico	.227	.42	.54
New York	16.063	8.72	1.84
N. Carolina	1.525	3.39	.45
N. Dakota	.428	.64	.67
Ohio	5.727	5.14	1.11
Oklahoma	1.254	2.25	.56
Oregon	.915	.66	1.59
Pennsylvania	7.810	7.93	.98
Rhode Island	.660	.52	1.27
S. Carolina	.739	1.88	.39
S. Dakota	.475	.61	.78
Tennessee	1.241	2.42	.51
Texas	3.440	5.30	.65
Utah	.343	.51	.67
Vermont	.283	.28	1.01
Virginia	1.313	2.30	.57
Washington	1.575	1.12	1.41
W. Virginia	.908	1.73	.52
Wisconsin	2.381	2.35	1.01
Wyoming	.202	.19	1.06

^aData are from Figure 1. ^bData are from Figure 2.

^cRelative ability is obtained by dividing economic resources by the number of children aged 5-17.

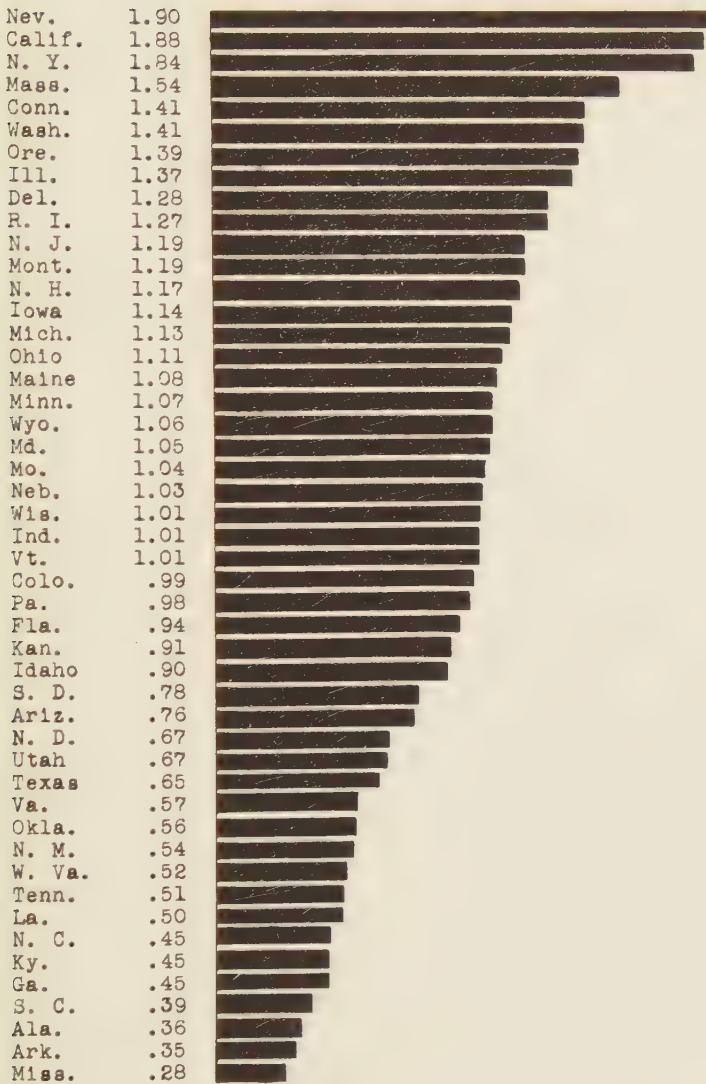


Figure 3.--Relative Ability of the States to Finance Education, 1935-1936. The data of this figure are from Table 2.

States totals, and the measure of resources was divided by the measure of need. From Figure 3 it can be noted that the relative ability of the most able state (Nevada = 1.90) is 6.8 times as great as the ability of the least able state (Mississippi = .28). The average relative ability of the States is equal to unity. Wisconsin, Indiana, Vermont, Colorado, and Pennsylvania are states with average ability to finance education, having relative abilities of 1.01, 1.01, 1.01, .99, .98, respectively. If the twelve most able states are compared with the twelve least able states, it will be found that the average ability of the former group is 3.3 times as great as that of the latter group.

Conclusions

If the results obtained in this study are compared with the results of other studies of the ability of the States to finance education, many similarities of findings will be noted as well as some differences, but one conclusion can be drawn from all of the studies--namely, that the States differ markedly in their ability to finance education, regardless of how this ability is measured. The most commonly used formula measures ability in terms of potential or theoretical economic resources per unit of educational need. Economic resources are usually determined by estimating the yield of a theoretical tax system or by estimating the potential resources from an index based on a number of economic indicators; and educational need is based on either attendance figures or census data.

The studies have all found that the state with the greatest ability has more than six times the ability of the least able state. They have further agreed that if the twelve most able states are compared with the twelve least able states, the ability of the former group is somewhat more than three times as great as that of the latter group. The range of differences in ability is greater if census data are used as the basic measure of need than if the measure of need is based on attendance data. There is general agreement that Nevada, California, New York, Connecticut, Massachusetts, Delaware, Rhode Island, and New Jersey are the most able states and that Mississippi, Arkansas, Alabama, South Carolina, Georgia, Kentucky, North Carolina, and Tennessee are the least able states; but there is some disagreement as to the extent of their

ability. For instance, if the resources of Delaware are determined by tax yield estimates, its ability is found to be 2.88, whereas, its ability is only 1.28 if the resources are measured by an economic index. The ability of Nevada by the above two methods is respectively 2.52 and 1.90, and the ability of New York is 2.44 and 1.84.

Careful analysis of the reasons for the wide disagreement of the ability indexes for certain states indicates that the more equitable method of estimating ability to finance public education is by an index based on census data and economic resources. The factor analysis method of estimating economic resources takes a more complete account of the different phases of economic life, and it provides an objective basis for weighting the items in the index. For these reasons, the indexes of the relative ability of the States to finance education developed in this study are thought to offer improvement over previous indexes.

The implications for education of the variation in ability to finance comparable educational programs are many. The fact that such a large portion of the Nation's children reside in the less able states means that future generations will have a large number of poorly educated citizens, and those who have received a good education may be in the minority. This is an undesirable situation in a democracy and may result in the dissolution of democratic ideals. Research has shown that the inadequate educational programs of the less able states can not be remedied by additional financial support upon their part, for even if many states spend all or a major portion of the revenue from an equitable tax system, they would still have educational systems inferior to the able states which must spend only a relatively small percentage of the tax revenue for education. If there is to be equality of educational opportunity and if the principles of democracy are to be effective in the United States, some financial aid must be provided for the less able states. This aid can best be provided by the Federal Government.

APPENDIX

Sources of Basic Data

1. Net Income from Income Tax Returns--Statistics of Income, Bureau of Internal Revenue, United States Treasury Department.
2. Number of Income Tax Returns Filed--Statistics of Income, Bureau of Internal Revenue, United States Treasury Department.
3. Motor Vehicle Registrations--Bureau of Public Roads, United States Department of Agriculture.
4. Wage Earners--Census of Manufactures, Bureau of the Census, United States Department of Commerce.
5. Value Added by Manufacture--Census of Manufactures, Bureau of the Census, United States Department of Commerce.
6. Value of Mineral Products--Mineral Yearbook 1939, Bureau of Mines, United States Department of the Interior.
7. Gallons of Gasoline--Bureau of Public Roads, United States Department of Agriculture.
8. Net Paid Circulation of Newspapers--Editor and Publisher, International Yearbook.
9. Building and Loan Assets--United States Building and Loan League, Chicago
10. Number of Telephones--American Telephone and Telegraph Company, New York.
11. Bank Resources--Annual Reports of the Comptroller of the Currency, United States Treasury Department.
12. Number of Radio Families--Radio Today, New York.
13. Postal Receipts--Annual Reports of the Postmaster General.
14. Retail Net Sales--Census of Business, Bureau of the Census, United States Department of Commerce and Sales Management, New York.
15. Total Wealth--National Industrial Conference Board, New York.
16. Postal Savings Deposits--Reports of the Postmaster General on the Postal Savings System.
17. Value of Farms in 1935--Census of Agriculture, Bureau of the Census, United States Department of Commerce.

18. Average Value of Farms--Census of Agriculture. Bureau of the Census, United States Department of Commerce.
19. State Tax Collections--National Industrial Conference Board, New York.
20. Number of Postal Savings Depositors--Reports of the Postmaster General on the Postal Savings System.
21. Life Insurance in Force--Insurance Yearbook of the Spectator Company, Philadelphia.
22. Gross Farm Income--Bureau of Agricultural Economics, United States Department of Agriculture.
23. Per cent of Population Filing Income Tax Returns--Statistics of Income, Bureau of Internal Revenue, United States Treasury Department.
24. Realized National Income--National Industrial Conference Board, New York.
25. Spendable Money Income--Sales Management, New York.
26. Savings and Other Time Deposits--American Bankers' Association.
27. Production of Electric Power--Geological Survey, United States Department of the Interior.
28. Wholesale Net Sales--Census of Business, Bureau of the Census, United States Department of Commerce.
29. Amusement Receipts--Census of Business, Bureau of the Census, United States Department of Commerce.

